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CRUISE REPORT

R/V COLUMBUS ISELIN [CI 7-78-1]

18 Aug - 4 Sep 78

James Robb
U. S. Geological Survey
Woods Hole, MA 02543

10 Sep 78

1. Ship Name: R/V COLUMBUS ISELIN
2. Cruise Number: CI 7-78-1 (Cruise 7-78, leg 1)
3. Project: Mid Atlantic OCS Environmental Assessment (BLM)
4. Area of Operations: Mid Atlantic Outer Continental Shelf and Continental Slope (38°N to 40°N)
5. Dates and Ports: Leave Miami, Florida 1752 EDT 18 Aug 78
Arrive Woods Hole 1210 EDT 4 Sep 78
Emergency port call at Atlantic City, N.J. 0810-1220, 31 Aug 78
6. Scientific Party:

James Robb	Chief Scientist, USGS
David Twichell	USGS
John Hampson	USGS
Peter Stinger	USGS
Valerie Paskevich	USGS
Patricia Brady	USGS
Timothy Bishop	USGS
Phillip Shea	USGS
Jerry McCarthy	USGS
Nicholas Lefteriou	USGS
Alan Goodman	USGS
John Kirby	USGS
David Mason	Woods Hole Oceanographic Institution
Robert Morgan	Master, R/V ISELIN
7. Purpose of Cruise: Study of slumping or mass movements of sediments on the Continental Slope using high-resolution geophysical profiling gear.

8. Navigation Techniques: Loran-C fixes at 20 minute to 5 minute intervals manually recorded from a Northstar 6000 Loran-C receiver using the new 9960 Northeast U. S. Chain. We attempted to record Loran-C fixes digitally as well, at 5 minute intervals, but these data lack a good time base and will require some corrective processing.
9. Scientific Equipment:
 - a. 40 cubic inch airgun with wave shaper
 - b. Teledyne minisparker (600 joule)
 - c. ORE 3.5 kHz transducer in overside fish
 - d. EPC recorders with various amplifiers and hydrophones
 - e. ORE side-scan with EPC dry paper recorder
10. Tabulated Information:
 - a. days at sea : 18
 - b. amounts of data:

airgun	2050 km
minisparker	2100 km
3.5 kHz	2100 km
side scan	22 km

11. Narrative:

The ISELIN left Miami, Florida at 1750 on Friday 18 August and proceeded directly to the survey area, slowing briefly to stream gear for tests during the passage. We arrived at the survey area on 21 August. With minor shakedown troubles, we ran a widely-spaced seismic survey with lines at about 20 km intervals over the continental slope until 29 August when we began a closely spaced survey (1/2 nautical mile spacing) of the continental slope between Lindenkohl and Cartaret Canyons. This area was chosen because there were few data in the area, and the upper continental slope seemed smoother, with less topographic relief than other areas. We hope the lesser relief will allow us to distinguish and study small

slump features more easily. Additionally, the smoother topography offered less risk to our experimental use later of the side-scan sonar.

We broke off the survey during the evening of 30 August because of a serious illness in the family of a member of the scientific party, and transferred him to a Coast Guard launch at Atlantic City, N. J. for emergency leave. We then went in to Atlantic City on the morning of 31 August to enable another member of the scientific party to make an emergency visit to a dentist. We resumed the survey by 1900 31 August.

Because of the threatened approach of hurricane Ella we began working with the side-scan sonar on the upper continental slope of the detailed study area on 2 September. The primary purpose of using the side-scan system was to determine whether it could be operated at slope depths, and secondarily to determine what features might be detected with it. We made two passes across the upper slope at depths between 250 and 450 m with excursions into two canyon heads. While preparing for a deeper third pass, the cable jumped the winch spool and was damaged. We retrieved the instrument and resumed profiling with the airgun and sparker.

We broke off work at 1630 3 September and proceeded to Woods Hole, arriving at 1210 4 September 78.

12. Initial Impressions of Results

- a. Slumping and mass downslope sediment movement occurs widely over the continental slope at small scale (small thickness, small displacement) as well as large scale.
- b. Individual slump features, although readily identifiable as large masses on individual seismic profiles, may have small lateral extent or may change considerably in their form and location on the slope within the 1/2 nautical mile spacing of our profiles.

- c. Continental slope topography cannot be described by dip (offshelf) profiles. Strike (longslope) lines show much rougher topography on the upper continental slope than a series of dip lines would imply. Rough and smooth upper slope topography give the same appearance on dip lines.
- d. Side-scan sonar data may show a grain of small (several meter) features paralleling the continental slope, perhaps resembling "cow paths" which may be small rotational slumps on otherwise smooth, featureless areas.
- e. Side-scan sonar data can be very useful in the study of the continental slope, but improved methods of operation, or more advanced equipment must be used. Raising and lowering the fish is too slow with our present system for use in topographically rough areas. Raising and lowering the fish also introduces noise into the record from the winch slip rings.

TRACK LINES
R/V COLUMBUS ISELIN
CI 7-78-1
21 Aug - 3 Sep 78

